

Hillier SL, McDonnell M. Vestibular rehabilitation for unilateral peripheral vestibular dysfunction. Cochrane Database of Systematic Reviews 2011, Issue 2, Art. No CD005397.

Design: Meta-analysis of randomized clinical trials

PICOS:

- Patients: Adults with vestibular dysfunction of unilateral peripheral origin, manifested by any of these: dizziness, vertigo, dysequilibrium, visual/gaze disturbances
 - o Diagnoses included acoustic neuroma, Ménière's disease, benign paroxysmal peripheral vertigo (BPPV), schwannoma, perilymphatic fistula, or a combination of these
 - o Ménière's was in the late stage with fixed vestibular deficit
- Interventions: Vestibular rehabilitation (VR) in which the patient plays an active role in exercises or movement-based (e.g., habituation with gaze stabilization)
 - o Passive maneuvers, medication, electrophysiological interventions were excluded
- Comparison: placebo, sham, or usual care; passive treatment such as medication or surgery, or an alternative form of VR
- Outcomes: Changes in symptoms pre- and post-trial, changes in function or quality of life
 - o Validated measures of physiological status (such as posturography) were considered as secondary, but not primary outcomes
- Study types: Randomized controlled trials

Study type and selection:

- Databases included the Cochrane ENT Register, PubMed, EMBASE, AMED (Allied and Complementary Medicine database in the British Library), CINAHL (nursing and allied health), LILACS (articles in Spanish and Portuguese), and other databases, including those in India, Pakistan, and Korea
- Two authors independently reviewed articles for eligibility and for risk of bias, using the Cochrane Handbook for the latter task; disagreements were resolved by discussion or by consulting a third expert for consensus
- The current review was an update of a 2007 Cochrane review, which had included 21 studies; the update included an additional six recent articles, for a total of 27 studies which had 1668 enrolled participants

Results:

- 13 trials of VR had control groups which had placebo, sham, usual care, or no intervention
 - o VR was significantly better than placebo in improving subjective dizziness and decreasing vertigo; VR also had advantages over control

in gait ataxia, Romberg scores, dynamic gait index, and functional activities of daily living

- Most comparisons of one form of VR versus other forms of VR did not find significant differences between them
 - o One study comparing simulator-based rehabilitation with a customized exercise program showed a greater decrease in a vertigo symptom scale with the simulator-based rehabilitation

Authors' conclusions:

- Current evidence with low risk of bias supports the use of VR for dizziness and daily function for peripheral vestibular dysfunction, with moderate to strong evidence that movement, exercise-based VR is safe and effective for unilateral vestibular disorders
- The frequency and intensity of VR required for a therapeutic response is not clear from the available data, but even a minimalist program of exercises and home exercise may suffice
- There is mixed evidence that canalith repositioning is more effective than VR for BPPV early in the course of treatment, with VR appropriate for incorporation into the long-term recovery from BPPV

Comments:

- Although a variety of VR interventions and outcomes were reported, the results tended to support VR even when the data could not be combined for meta-analysis
- Analysis 1.7 combines VR versus control/placebo for three studies by Yardley, and shows a high degree of heterogeneity
 - o This is described in the Discussion section as arising from the clinical heterogeneity of the study populations, in which Yardley 1998 and 2004 are unilateral vestibular dysfunction and Yardley 2006 is Ménière's disease
 - o However, the VR in Yardley 2004 included a session of instruction with a nurse and a video of the exercises to be performed; Yardley 2006 simply gave the patients a booklet with the instructions, and did not include direct instruction from a nurse
 - o Yardley 1998 showed VR to be effective (but with a smaller effect size than Yardley 2004; while Yardley 1998 and 2004 both had instruction from a nurse, the 1998 study did not include a video
 - o It may be that the difference in the conditions being treated explains the difference in results; it is also likely that having some professional instruction and a video demonstration of the VR exercise is required for best results
- The advantage of the simulation-based program is based on a single study (Pavlou 2004)
 - o Analysis 3.6 reports the vertigo component of the vertigo symptom scale for Pavlou 2004, which shows simulator better than VR; however, the text of Pavlou reports that there was not a group-time

- interaction for this outcome (meaning that the vertigo responses was not related to treatment beyond the play of chance)
 - Pavlou did report a significant group-time interaction for a related outcome variable, the vertigo visual symptom scale
 - The VR program for Pavlou 2004 was more complex than for Yardley, and this may affect adherence to the program
 - Both VR and the simulator groups improved over time, and the results should not be interpreted to mean that a simple VR program is less effective than a more complicated one
- The Yardley studies either excluded or had very few patients with BPPV, suggesting that VR is effective for a wider variety of vestibular dysfunction conditions

Assessment: Adequate for good evidence that VR involving active movement with brief instruction from a health care professional is effective in reducing dizziness and improving function

References:

Pavlou M, Lingeswaran A, et al. Simulator based rehabilitation in refractory dizziness. *J Neurol* (2004) 251 : 983–995.

Yardley L, Donovan-Hall M, et al. Effectiveness of Primary Care–Based Vestibular Rehabilitation for Chronic Dizziness. *Ann Intern Med.* 2004;141:598-605.

Yardley L, Kirby S. Evaluation of Booklet-Based Self-Management of Symptoms in Ménière Disease: A Randomized Controlled Trial. *Psychosomatic Medicine* 2006;68:762–769.

Yardley L, Beech S. A randomized controlled trial of exercise therapy for dizziness and vertigo in primary care. *British Journal of General Practice*, 1998, 48, 1136-1140.